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Combat Crew

strategic air command

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OCTOBER 1978

ONLY ONE DEFEAT

Lieutenant General Bryan M. Shotts
Commander, Fifteenth Air Force

Only once was the famous racehorse Man O'War defeated. It happened in 1919 when he was two years old and had won six consecutive starts. Curiously, his loss was to a horse named Upset. But it was bad racing luck that beat Big Red. An unqualified starter working the gate at Saratoga that day caused a five-minute delay in the break from the barrier. Man O'War, always nervous at the post, danced and bobbed his head. When the field broke away, Big Red was off sidewise, and ended up fifth in a seven-horse field.

Today, we are engaged in a different kind of race — one that may hold as its prize the survival of our democratic way of life. It is a crucial race, and the rules allow for political maneuvering and Third World romancing while masking direct confrontation and open hostility.

Our race is run in an environment of high technological advancement and nuclear proliferation. Neither of these is new to us, but when coupled with dwindling natural resources, budgetary constraints and cutbacks in personnel, demands on the participants are greatly expanded. Horse racing buffs tell us that Man O'War was defeated by one man — an assistant starter. Is it possible that our crucial race could be lost as the result of the actions of one man or one woman? Consider what happened during a recent IG generation exercise. A unit found that after all the hard work of generating their aircraft, the crews could not fly the mission because incorrect authenticators had been issued. True, there had been poor coordination by several people, but somewhere one person had made the initial error.

I am concerned by recent observations and unit inspection/mishap reports which indicate a few individuals may be unwilling to accept responsibility or to make the decisions inherent in their positions. In short, they are less than professional.

The concept of military professionalism has developed slowly since the Civil War. The technological demands of this period required greater intelligence, wider education and broader expertise than previously. This increasingly expert character of the military profession is reflected in the trend toward greater specialization and the demand for closer coordination at all levels. The defense of purely

FLARE

parochial interests or the failure to perform a given task to the utmost of one's abilities may well impact upon an entire operation.

Professionalism has many definitions, but perhaps it is best explained by what it entails — moral integrity, discipline, belief in oneself, acceptance of responsibility, the ability to make decisions, and practice.

The quality of an organization is a composite of the qualities of its people. The energy, disciplined will and strength of purpose of an individual not only shapes his actions, but also impacts upon the effectiveness of the organization.

The words "discipline" and "professionalism" go hand in hand. Professionalism requires discipline, and both must be maintained and practiced. The essence of both is not only in knowing, but also in doing.

Acceptance of responsibility and the risk of decision making are inherent in your job. The shouldering of those responsibilities may not guarantee professional performance, but the lack most certainly guarantees failure. A slackening in standards of performance or a complacent attitude of "let the other guy do it" poses a threat to our military effectiveness. We can ill afford to compromise our vigilance, for that is the key to freedom.

The demands placed on the military today are more severe and awesome than ever before. We are continually asked to do more with less; and that requires each of us to work harder, more productively. It is imperative that our performance in daily work assignments be of the highest caliber. Each of us must strive to achieve and maintain a level of excellence in all facets of our job. The most deadly disease today is not cancer, but complacency. It must be avoided at all costs.

As I enter retirement after nearly 37 years of military service, I am proud of the dedication and professionalism of the men and women with whom I have served. Their fortitude and sacrifice have made SAC and this nation stronger. It is my hope that their mental toughness, resolute purpose and strong belief in themselves will remain a vital element in the makeup of those to whom we pass responsibility. We cannot allow the outcome of our race to be jeopardized by assistant starters. To us, the task of keeping the Strategic Air Command strong and effective is our way of avoiding "only one defeat."

★★★

Combat Crew

Magazine of the Strategic Air Command - 29th Year of Publication

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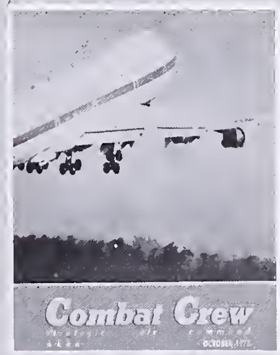

ON OUR COVER

An E4A aircraft — a 747 with several modifications — provides a capable platform for the JCS Emergency Airborne Command Post. For more on this story, see page 4.

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E-4A

A Pilot's Report

Capt John B. Sams, Jr.
1 ACCS, 55 Strat Recon Wg, Offutt AFB

"Gilby 31, Andrews weather. Sky obscured, visibility one-quarter mile in rain, altimeter 29.78, wind reported 290 degrees at 14 knots, gusting to 20. Runway is reported wet and runway visual range 1600."

"Gilby 31, roger, 29.78. Request ILS to runway 01L at Andrews."

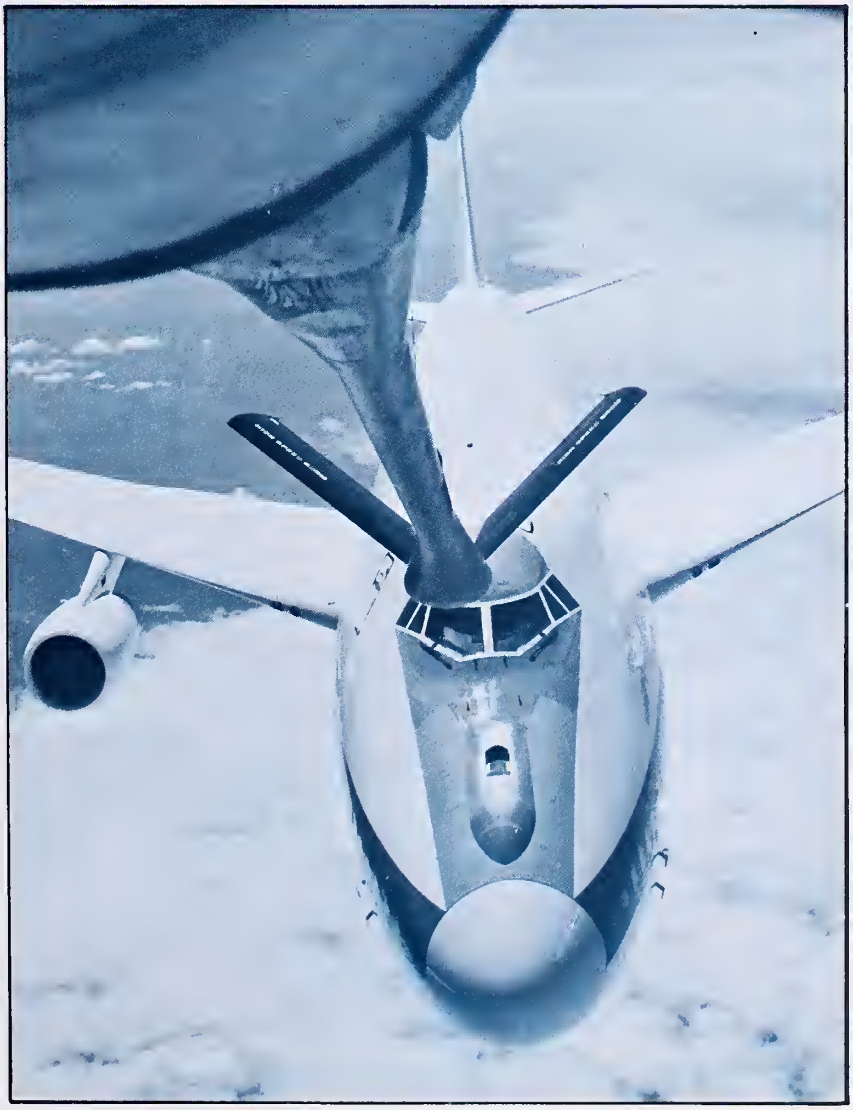
Most of us in SAC realize this is below command weather minimums of 200 feet and one-half mile and our next action as an aircraft commander would be to proceed to the holding pattern and update the weather at our alternate. A quick call to the command post would be in order to advise them of the new weather conditions and let the DO know how long our air machine can endure before proceeding to our alternate.

But for one organization in SAC, the 1st Airborne Command and Control Squadron, approaches in this minimal weather condition are almost routine. Routine, because they are practiced continually thanks to the Cat. II equipment installed on the E-4A Advanced Airborne Command Post. This equipment safely allows approaches with a runway visual range (RVR) as low as 1200 feet. Decision heights are measured with the radio altimeter to 100 feet AGL. When combined with the automatic landing system, the pilots can accomplish the approach from enroute altitude to touchdown without even touching the yoke.

The Cat. II equipment is essential in providing a survivable, capable platform for the JCS National Emergency Airborne Command Post (NEACP). The NEACP provides support to the President, the Secretary of Defense and the JCS for the direction of our armed forces during a general war. This includes the execution of the Single Integrated Operations Plan (SIOP). For the bomber and tanker forces, the objective is to launch and survive for mission accomplishment. For the NEACP, both landings and departures are necessary for mission accomplishment and adverse weather factors must be reduced to the lowest possible level.

The E-4A From the Crew's Perspective

The E-4A is a basic Boeing 747-200 with several changes incorporated to facilitate its use as the NEACP. From the exterior, the most notable change is the addition of a self-contained folding stairway leading to the forward right side of the aircraft providing freedom from ground-based support stairways. The addition of an inflight refueling receptacle forward of the cockpit, and the trailing wire antenna system along with aft lower fuselage, complete the noticeable exterior differences.



The drive from precontact requires attention to power, bow wave effect and pitch.

Ascending the 38 steps up three flights of stairs, the new flightcrew member is introduced into a new world of aviation known previously only to the most senior commercial airline crews. To the basic three-man flightdeck crew (captain, first officer and flight engineer) has been added a navigator's position with radar, heading information, an IFF (number two), altimeter and most importantly, access to control the three separate inertial navigation systems (INS) on board. Oh yes, the sextant remains!

For this former B-52 pilot, the instrument panel is a maze of data relaying readouts and control heads never before witnessed: two VORs, two TACANS, two UHF radios, two VHF radios with dual control heads, two ADFs, three separate autopilots, three separate flight directors, an altitude select function which allows automatic autopilot level-off, engine instruments with digital as well as scale readouts (round dials) and everything necessary to make all this redundant. The captain and first officer's instrument panels are void of any aircraft system controls and readouts, since these systems are under the control of the flight engineer.

The cockpit is designed to be a pencil-free environment after copying the ATC clearance. Headings, altitudes and courses can be selected and tied into the autopilots and flight directors, and the dual heads on the VHF radios make copying ATC radio frequencies a thing of the past.

A Model of Simplicity

Flightdeck activity is the model of simplicity. Each phase of flight (preflight, before start, and so forth) for operating the aircraft follows a standardized "scan" of the cockpit panels or equipment. Besides standardization, this scan enables the flight crew to more readily memorize the required items, insures that all necessary actions have been taken, and minimizes the time required. Normal procedures for each phase of flight are performed by recall. Following this, the normal checklist is used to ascertain that all safety items have been completed. Anytime the aircraft is moving, either taxiing or in flight, the flight engineer reads all checklists. This frees the pilots for their primary task of aircraft operation and clearing.

Engine start is normally 10 minutes prior to takeoff. All four GE CF-6 engines can be started simultaneously, although this is not normally accomplished. On the flightdeck there is no indication of engine start other than the engine instruments and the crew chief calls. No noise. No vibration. The doors are armed for emergency exit, the lower lobe evacuated of personnel, the umbilicals cut, and the crew chief clears the aircraft for taxi.

The dynamics of the 747 soon become apparent. Normal training weights are about 600,000 pounds, but the maximum gross weight for takeoff is over three-quarters of a million pounds. Each pilot is acutely aware of the necessity for judicious use of power. Not too much, but just enough to get her rolling. Taxi speeds are difficult to judge so a constantly displayed ground speed digital readout is provided at one corner of the attitude indicator.

From 28 feet above the ramp, the view is panoramic. Taxiways look much narrower. The tower looks much shorter. Thanks to body gear steering, the E-4 is just as agile on the ramp as a KC-135. Turning radius is on the order of 142 feet, but the tail doesn't "grow" in a turn as on some other jumbos. For taxi, the outboards are kept at idle when overhanging the grass, not so much for the prevention of FOD to our CF-6s, but in an effort to prevent debris from being blown back on the taxiways in front of following traffic. Incidentally, 1500 feet is close enough when taxiing behind an E-4. Rocks and debris can be blown that far even at low taxi thrust settings. A followup inspection of the taxiways by the SOF is a good idea for airfields where the E-4 does not normally operate.

Effortless to Fly

Takeoff performance is truly remarkable. The four CF-6s develop a total of 210,000 pounds of thrust and rapidly accelerate our training aircraft (190M fuel load) through the 153-knot takeoff speed as we rotate to our initial climb attitude of 19 degrees. Once airborne the aircraft is extremely light on the controls and almost effortless to fly. The gear is retracted at the first positive indication of climb. At 1500 feet AGL, climb power is set by the engineer and the nose is lowered for acceleration. The flaps are retracted in increments as the aircraft accelerates through approximately 236 KIAS. A 250-knot speed is maintained through 10,000, then acceleration is begun to climb speed of 320 KIAS/.82 Mach. The engineer constantly refines the power settings using a power setting computer. The climb to FL330 takes 16 minutes and 98 miles.

Air refueling is accomplished routinely. Although there is no refueling mode on any of the autopilots, control forces remain light throughout the maneuver. Rendezvous procedures are compatible with other large aircraft through the precontact position. A spoiler has been added to operate in conjunction with the slipway doors just forward of the cockpit, smoothing the airflow from the tankers boom ruddevators in the refueling envelope. For the drive from precontact to the contact position, three factors must be considered:

—inertia effects at high gross weights require careful attention to power needs;

—closure must be made smoothly and slowly to minimize the bow wave effect; and

—the nose wants to drop just prior to contact. With these three items carefully considered, transition from B-52 and KC-135 equipment presents no special problems. Tanker autopilot-off refueling is more difficult, although routinely accomplished.

The E-4 Does the Work

Enroute descents are utilized exclusively for their fuel saving benefits and passenger comfort to align the aircraft on downwind.

"Gilby 31, expect ILS to runway 01L at Andrews, descend and maintain 2500, left turn 050, base leg, cleared approach."

"Out of 3000 for 2.5, left to 050, cleared approach, Gilby 31."

The approach has been briefed, the ILS and bea-

Continued on page 15

ILLUSTRATION BY ARTHUR HAYDEN

Escape & Evasion In The Winter . . .

CAN YOU SURVIVE?

Capt Robert J. Fehrenback
668 Bomb Sq, Griffiss AFB

What would you do if you had just ejected into a northern tier environment? The enemy may be down there and you must avoid him. Besides avoiding the enemy, you must also take positive steps to establish contact with a local evasion net — all in all, a formidable task. But you have another opponent complicating this task even further: freezing cold, waist deep snow, bone chilling wind and blowing snow obscuring your vision.

Except for actual ejection, all of the above were experienced by volunteer crewmembers, including myself, during the winter of '77 when Exercise Empire Glacier was held at Fort Drum, Watertown, New York. This exercise can be broken down into six basic phases: insertion, evasion, contact, authentication, movement within evasion net, and extraction.

Insertion was accomplished by means of a helicopter drop instead of actual ejection. The drop site had been described in detail and a site for rendezvous with the evasion net was chosen on the large scale charts supplied. On the ride to the site we studied the terrain to acquaint ourselves with our general location. All of this helped us, but also served to point out how much more difficult an actual EWO ejection would be: the shock of ejection, possible disorientation during a combat low level flight, and a much smaller scale chart. These adverse factors would obviously make ground orientation much more difficult.

Simply traversing the terrain enroute to our rendezvous site was difficult enough, but using proper evasion techniques multiplied our problems. The snow was at least waist deep and progress was painfully slow. Straight line distance from drop zone to rendezvous site was about 800 meters. Calling on necessary evasion procedures, such as using contours and tree lines for concealment, added distance to this figure. Altogether, we probably covered about 1000 meters. This may not seem like a great distance to travel, but with the deep snow and other winter elements, it took us almost three hours to reach the rendezvous site. There were many temptations to cut across a meadow or field instead of sticking to a circuitous tree line, but the fear of discovery drove us to use proper techniques. It was amazing how much of our previous training came back almost subconsciously.

A detailed method of contacting the evasion net had been briefed to us earlier. This was a series of signs and countersigns designed to assure to some degree, that we were not the enemy in disguise. After spending the night out in the elements, it was more than comforting to find our contact had arrived. We were taken by car to a "safe house." Our contacts were still not sure of our identity, so blindfolds were used to guarantee their anonymity as well as to keep us unaware of the location of the safe house. The safe house, for some of us, turned out to be an old cow barn. For others, it was the basement of a house. It was there that the next phase of our experience occurred.

The authentication process was one of the most critical phases of our entire trip. This was the means by which the escape net could positively verify our identities. There were a number of methods used, each a backup for the other. Although this was only an exercise, we still spent many a tense moment waiting for our I.D.'s to be verified. In a real wartime situation, downed crewmembers would be considered prisoners until positively identified.

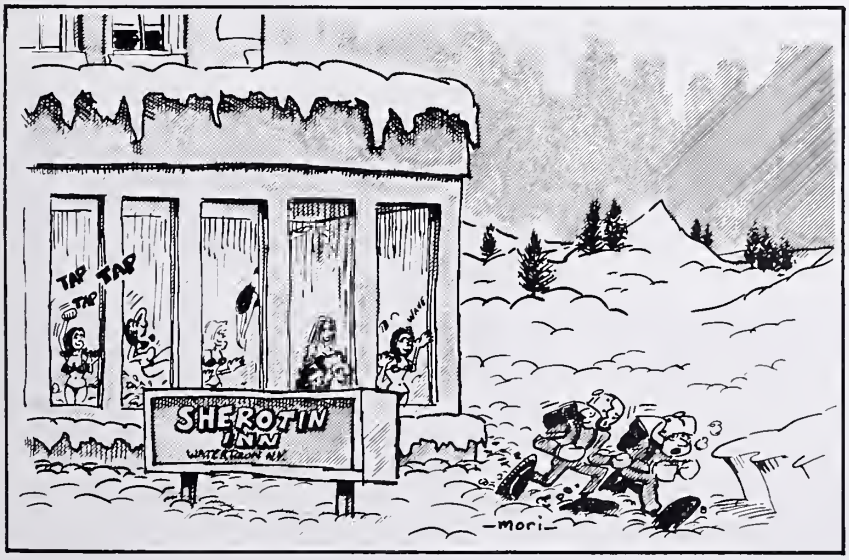
After authentication, we were accepted as bona fide American airmen. Most of us spent the next five to six days at the same location where authentication had taken place. In a real situation, we probably would have been moved from place to place within the escape net and may have had to wear civilian clothing. The rule when moving within the escape net is to simply do what you're told.

The final step in the E&E process is extraction. It is during this stage that you're actually brought out of the enemy environment. In our case, it was another car pickup. In a wartime environment, it could have been a cart ride, train trip, boat ride or any means chosen by the escape net. Whatever the means used, the end result would be freedom.

From our training experience, we arrived at a number of conclusions regarding our equipment and E&E training. First, we have to emphasize E&E training. Currently, it falls short. Its content needs to be reevaluated, but most importantly, crews have to be remotivated to learn what's presented. All of us who took part in the exercise had not paid too much attention to E&E training previously. During the exercise, our attitude changed.

We also found we were lacking some necessary equipment for winter survival. We went to Fort Drum with the equipment in our seat kits. We also had sleeping bags and long parkas instead of the short flight parkas normally issued to crewmembers. Our general consensus was that both the sleeping bag and the long parka would be necessary for basic survival. The "7-in-1" tool should also be in the kit as well as a Swiss army knife. Travel in deep snow would be greatly facilitated if we had collapsible snow shoes similar to those now carried by some Air Force combat control teams. The quilted green long underwear is also necessary, although it has now been deleted from crewmembers' authorized clothing items. Adjustable shoulder straps on the backpack currently in the seat kit would also be a good idea. Mukluks with the rubber portion extending to the ankle would aid in keeping feet dry.

Empire Glacier taught us much. It brought up some new ideas, but its greatest impact on us was a reawakening to E&E training in general. The exercise emphasized that winter survival will certainly be no easy thing; but more importantly, it taught us that, given the proper tools, we can survive.



AND THEY WONDER WHY WE CAN'T STAY SERIOUS ABOUT AN ESCAPE/EVASION EXERCISE!

BLACK WEDNESDAY

Maj Dev Johnson
28 Bomb Wing, Ellsworth AFB

Early on in my life, I was always one of those people who assumed that serious problems always happened to the other guy. I had never been involved in a serious aircraft emergency and didn't really know how I would react if such an event were to occur.

This condition ended abruptly on the night of December 20, 1972. So many B-52 aircraft were lost that night that they called it "Black Wednesday." My story began at Guam where we were part of a large force about to launch on a mission to Hanoi. This would be our second mission to that target. Night one had been relatively easy, other than the fact that the 16-hour mission was flown without an autopilot. Our crew was Crew E-10, TDY to Guam from March. We had been together without a crew change for over a year and if there were any fears as we departed Guam that night, they were not related to the ability of the individual crewmembers. We had too many missions together to be bothered by such ideas.

The mission was as normal as a mission to Hanoi could be expected to be, until we were IP inbound. The closer we got to the target area, the more painful our awareness became that we had been singled out and were the recipients of a barrage of SAMs. Shortly after bomb release, the aircraft was rocked by a loud explosion. Two engine fire warning lights illuminated, a rapid decompression was experienced, and three of the five occupants of the forward cabin experienced schrapnel wounds. After only a few seconds, all electrical and hydraulic power on the aircraft failed. The sparks that had been shooting through the BNS and ECM racks ceased as the electrical power was lost. The gunner reported fuel streaming from the tanks in the wings and a hole was observed in one of the drop tanks which immediately drained that tank and left us with a 19,000 pound fuel unbalance. This was a chance to find out how I would react to a serious emergency.

I knew immediately that we would never be able to get back to Guam, so my plan was to head for Utapao, Thailand. If the copilot could restore electrical power, we might be able to jettison the drop tanks and configure the aircraft for landing. No such luck. Apparently, the SAM had torn up the air bleed ducting which powered the hydraulic packs and the alternators because neither could be restored.

Faced with a certain bailout situation, our next concern was to get back to friendly territory. In order to maintain flying speed, we had to start a descent as the engines began to fail from fuel starvation. Using a stand-by mag compass for a heading reference and the few remaining pitot-static instruments for airspeed and altitude, we figured that we had a reasonably good chance of reaching Thailand since our descent rate was not excessive. As additional engines quit, it became necessary to increase the descent rate. Finally, with signs of life on only two engines and a 1500 fpm rate of descent, we knew that our bailout would be over enemy territory.

We had succeeded in reaching mountainous terrain. The peaks were visible by the moonlight as they protruded through what was otherwise a solid undercast. Twenty thousand feet and descending, and less than 10 minutes from ground impact (the terrain was 5000 feet), I decided that the aircraft that had done so well in getting us out of the target area was now a liability and a controlled bailout was begun. The first man was gone at 20,000 feet. By the time it was my turn, I was at 16,000 feet. There was a longer time interval between the copilot and myself than the other crewmembers. It was not just so I could log some solo flying time in a B-52 and it was not so I could gaze in awe at the vastness of the B-52 cockpit when the copilot's ejection seat was gone. This was the first time I had thought what I would do in the event of a seat malfunction. I could fly the aircraft, while the others bailed out, but that took full displacement of the controls due to the massive fuel unbalance. I decided that my only chance in the event of a seat malfunction would be the open hatch over the copilot's position. My concern was unnecessary, since the seat worked perfectly. The automatic feature of the parachute didn't work and I had to open it manually. Other than that, everything worked fine.

The SAR effort on the morning of the 21st is another complete story that I won't go into here. It was a demonstration of professionalism and dedication that I have never seen anything like before or since. It was marred by the fact that only five of the six crewmembers were recovered; we still mourn the loss.

During the period of hospitalization that resulted from the schrapnel wounds inflicted by the SAM, I had a lot of time to reflect on the reaction of myself and the other crewmembers to the emergency. I marvelled at the total lack of panic that was visible. The ability of the crewmembers to make decisions and to analyze the rapidly changing situation was a beautiful thing to observe and be a part of. What were the factors that enabled this to take place? Was it just an accidental combination of factors, personalities and circumstances, or were there some elements that could be identified so that they could be developed to be used again in the event of a future crisis? Actually, there were several factors that could be attributed to our ability to survive this incident.

The first thing was the training. The long hours in pilot training, the severe competition, the pressure of check rides, irritable instructors, and other events serve a definite purpose. An individual who pins on his pilot wings has passed the first big test. He knows with a degree of confidence that he has the ability to perform under pressure. Nav training is much the same. I say that because I was every bit as proud of my Nav wings when I pinned them on as I was the pilot wings that I received four years later.

The second factor was the instinct to survive. The task of maintaining aircraft control was difficult enough and took so much attention and effort that there was not time to be afraid. The other crewmembers reacted in a similar manner. The Nav team used the fragments of information that we could pass to them to maintain an approximate DR position. The copilot was as busy in the cockpit as I was. The gunner was still calling SAMs long after they had become the least of my concerns. There was first aid to perform, ejection equipment to inspect and plenty of other things to occupy the minds of the crewmembers. The lesson here is that fear can actually be displaced by constructive thinking. The mind is such that they can't both be present at the same time.

Another condition that can be concluded as essential, and playing a major factor in our recovery, was the ability to communicate. That beautiful interphone system needs only battery power, and it functioned perfectly right up to the last bailout. In talking to crews who returned from POW status, we heard of the terrorizing experiences where aircraft with damage similar to ours but without operative interphone systems became the scene of some of the most nightmarish experiences that I have ever listened to. There is nothing more frightening than the unknown.

From this whole thing, I became aware that fear is a controllable element. To reduce fear during a critical emergency, the crew commander must be able to assure his crewmembers that the situation is under control. If he has been less than truthful with them during noncritical situations his credibility will be affected. This could seriously hamper the ability of the crew to work together closely during a serious situation. Another factor that can reduce fear is to know your systems and procedures. If you know how that degradation of a certain system will affect you, then the area of concern can be eliminated. Not knowing what to expect can create concern for things that might not need to be thought of. These attention diversions could be costly.

Another big aid is to rely on the abilities of others. Let them take the stress off your mind by doing the calculations, reading and figuring necessary. Believe in their abilities and let them know that they will play a major role in the successful outcome of your problem. Don't try to do everything yourself. As the crew commander, you should concentrate on aircraft control and should lead the others in the steps that will be followed. The last factor is the element of example. The highest compliments that I have ever received were from the members of my crew who mentioned that they felt good about their chances of coming out of this experience because they knew that I was confident in the ability of both the aircraft and the pilots. I also can thank them for their efforts. It was a crew effort all the way.

You and I do not know when the next crew will have to put it all together to survive a crisis. Be aware that the next one might be you and the factors that will determine the outcome of the situation are controllable and can be practiced by your crew every time they are in the air.

HEADS UP AWARD

Captain Kenneth L. Stanford, 9th Strategic Reconnaissance Wing, was flying an overseas operational U-2 high altitude sortie. After one hour of flight, he retarded the throttle slightly to adjust the engine EGT. Throttle movement resulted in no corresponding movement of engine instruments; further throttle movement proved equally ineffective. With the engine now operating above maximum EGT limits, the captain found himself with a runaway engine which could only be shut down by activating the emergency fuel shutoff switch.

A check revealed that all normal alternates were IFR. Captain Stanford headed toward the nearest VFR base which was several hours flying time away. By this time, the EGT was considerably above maximum limits. He was faced with the decision of descending to a lower altitude to reduce EGT but consume more fuel, or to maintain his altitude to conserve fuel but risk further possible engine damage. Because the nearest VFR base also had crosswinds within one knot of U-2 landing limits, the possibility of further diversion had to be considered.

Captain Stanford chose to remain at altitude and save fuel. Upon arriving over his first recovery base, he discovered the winds had abated slightly and decided to remain there. After holding for several hours to permit a recovery team to be assembled, he shut down the engine and began gliding down for a "deadstick" landing.

Passing FL 280, Captain Stanford attempted to configure the aircraft for landing, but discovered his hydraulic system would not function properly. Realizing that a no-flap flameout approach to a strange runway in a strong crosswind would be extremely hazardous, he elected to attempt a restart to get sufficient hydraulic pressure to properly configure the aircraft. During the restart, the EGT again went out of limits, but allowed him to get his flaps down and reset his trim before he shut the engine down again. Maneuvering between buildups and low clouds, Captain Stanford located the recovery base and made a flawless flameout pattern and landing.

The timely and decisive actions of Captain Stanford under sensitive operating conditions and with marginal weather prevented possible injury or loss of life to himself and resulted in the safe recovery of an extremely sensitive and valuable reconnaissance aircraft. His cool deliberation and outstanding pilot skill in this serious inflight emergency merits his selection for the Heads Up Award.

SSgt Kenneth L. Trexler (standing), radio maintenance technician and radio operators Sgt Victor S. Guillermo (seated, right), and SSgt Robert E. Gosda, configure radio equipment for final verification of the ALCC's capability to transmit electronic launch signals to SAC's Minuteman fleet. Photos by SRA TODD J. GRINDE

MINOT DEPLOY

Captain James R. Boensch
4th ACCS, Ellsworth AFB

"Got your kits checked out?"
"Yeah."
"Got your guns?"
"Yeah."
"Let's go."

Four men in flight suits walk past a bank of safes, out the electrically controlled door, and into the icy early morning South Dakota wind at Ellsworth AFB. They carry 90 pounds of classified documents in two thick leather briefcases.

"Third issue of the morning," yawns one of the two code controllers, "been a long day already." A single "yeah," or no reply — it's too early for elaboration by them or their two companions, an airborne missile combat crew.

Thus begins the Minot Deploy, a ritual repeated every Wednesday morning as the 4ACCS prepares to deploy replacement crews for ALCC-2 and 3 — two EC-135 aircraft on deployed alert at Minot AFB.

Before receipting for code components, Airborne Missile Combat Crewmembers Maj Walter R. Neal, Jr. (right) and Capt Norman G. Ruiz check one of two launch keys at the launch control panel. ALCC tests, preparatory launch commands and launch commands are initiated at the LCP.

The Carryall, piled high with baggage and briefcases, comes to life and slowly warms up. A few blocks away it stops in front of one of the 28th Bomb Wing alert facilities known by 4th ACCS personnel as the PACCS Pad (for post attack command control system). After being admitted, the group quickly strides to the vault, a large steel and concrete walk-in wall safe. One of the code controllers picks up the phone. Following authentication with Security Police headquarters, he dials the combination on one of the two locks embedded in the door, then waits as his partner dials his. Neither person will ever know the other's combination. After entering and securing alarm systems, they begin the "issue" of ALCS code components.

By 0630, the issue will be complete and the ALCS crew assigned to prepare and load the replacement aircraft will have completed most of their checklists. Their procedures, which allow no tolerance for shortcuts, will have assured that the electronic equipment aboard the aircraft is working properly. The aircraft must operate flawlessly, with no airframe writeups and not so much as a burned out bulb or a single test failure of airborne launch control center equipment.

The data processor unit, the heart of the system, is an on-board computer which controls the other critical electronic devices. A thorough checkout insures its capability while airborne to direct transmission of electronic signals capable of EWO launching any or all 1,000 of SAC's Minuteman sorties. Protection against inadvertent electronic disclosure of top secret information is also assured.

Following completion of checklists, the airborne missile crew verifies their equipment ready for alert, as do the "Radios" — two radio operators from the

4th ACCS Communications Branch and the "R.M." — a radio maintenance specialist from the 28th Avionics Maintenance Squadron. The four-man flight crew, having completed a meticulous preflight checklist, verifies the aircraft ready for alert. Engines started, the crew chief, from the 28th Organizational Maintenance Squadron, is the last crewmember aboard. A Minot deploy is truly a team effort — one practiced so often, it moves with clockwork precision.

While the aircraft is taxiing, the "Radios" and "Missiles" run a final test of the aircraft's capability to transmit its vital, highly classified electronic commands. The missileers step forward to the radio compartment and "destruct test" their volatile keying assemblies. Developed by the National Security Agency, these two components contain the codes necessary to decrypt critical command data stored in the data processor memory. Special handling procedures require that no more than one of the two can be out of secure storage at a time. Aboard the aircraft, the volatile keying assemblies are kept in the code processor assembly, secured by two locks so that no one person can ever have access. Divided into separate code groups, officers of one code group are not permitted to handle the keying assembly of the opposite code group. Satisfied that the coded information in the volatile keying assemblies can be destroyed manually or automatically, in case of a crash or other emergency, the missilemen return to their seats and prepare for takeoff.

It's gone very well today, they think to themselves. Occasionally, equipment malfunctions cause their TO knowledge to be more sorely tried. More than 100 pages of unclassified fault procedures in their TO and an additional classified TO, specifically for troubleshooting equipment malfunctions, lie unopened today.

Next Wednesday, the same crews will return to Ellsworth, sometimes following an airborne JCS/SAC EWO exercise, and usually following ALCS airborne electronic testing of at least one of the six Minuteman Wings in SAC. ALCS is responsible not only for providing a survivable alternate launch capability for the Minuteman Weapon System, but also for providing command control communications to Minuteman Launch Control Centers. Every week, each Minuteman sortie in SAC is tested by an ALCS-equipped aircraft, and every underground launch control center contacted by airborne missile crews.

Tired, as only people who have been away from their families for extended periods of time can be, they return their classified material, debrief their particular function, pick up their gear and go home. The mission is complete.

E-4A

Continued from page 7

cons tuned and identified, inbound courses are set, the heading is set to 050 degrees and the aircraft electrical systems isolated. Land mode is selected on the navigation mode switch and all three autopilot-engage switches are placed to command. The E-4 is doing all the work now. The first autopilot engaged is controlling the aircraft and we descend to 2500 feet. The other two autopilots are armed. Radio altimeters are set 100 feet for the captain, 2000 feet for the first officer. He will select 200 feet after passing 2000 AGL. The descent/approach checklist is complete. As the localizer comes alive, the aircraft turns and intercepts the inbound course. We level at 2500 feet.

The aircraft tracks down the middle of the localizer course. Drift is perfectly compensated. As the glideslope uncases, the gear is lowered. At glideslope intercept, flaps are lowered to 30 degrees and the autothrottles are engaged for our final approach speed. The landing checklist is complete.

"Gilby 31, departing 2.5, gear checked."

"Gilby 31, cleared to land."

Out of 2000 AGL, the first officer makes his call and resets his radio altimeter to 200 feet. After passing 1500 feet AGL confidence tests are automatically performed: the triple autopilot engage lights illuminate, a blue test light illuminates and extinguishes, the aircraft turns slightly left, then returns on course and the flare armed lights illuminate. The autopilot with neither the highest nor lowest signal input controls the aircraft for both pitch and roll. Each autopilot constantly cross-checks the others. The OM is passed. The first officer begins making his callouts:

"100 feet above decision height."

"DH, land."

Four approach lights and the threshold lights are visible. At 53 feet the aircraft is captured in the flare mode and green flare lights illuminate. The aircraft begins to flare.

"Fifty feet."

At 30 feet, the throttles begin retarding towards idle. The flare continues.

"Thirty feet, 10 feet, we should be. . ."

Touchdown. Speed brakes up. Reverse thrust is manually selected. Autopilots are disengaged, their work complete. Rollout visibility reveals a single 1000-foot marker at a time.

"Andrews tower, Gilby 31, ILS rollout."

"Gilby 31, roger, contact Andrews ground 121.8 when clear . . ."

Grampa's thoughts on the B-52

Lt Col Sidney B. Hanna, Jr.
325th Bomb Sq, Fairchild AFB

Winter is coming and with it different flying conditions. Runways and taxiways can be slippery from water, ice, and snow. The odds for weather penetrations and approaches increase. It is a time for knowing your capabilities and limitations as well as those of your aircraft.

Let's talk about you, the crew. Your attitude, or mental condition, influences your ability to fly safely. Fatigue, anger and fear father the majority of our unsafe or high risk situations. I purposely exclude alcohol and drugs since I believe SAC crews are disciplined to avoid mixing flying and drinking. Certainly either alcohol or drugs will induce high risk situations.

However, we are not quite as reluctant to fly even though we did not receive proper crew rest. Our maintenance manual requires a wing to fly 30 percent of its sorties through the "sterile" period. This gives birth to what crews refer to as the "red eye" special. Beware of this sortie, it is loaded with high risk factors. This sortie should be planned as short as possible to reduce fatigue. Taking off at

2200, flying eight hours and coming back into the traffic pattern for an hour or more precipitates good training for people who sit on accident boards, not crewmembers!

How about the regular day flights? Here we don't recognize fatigue as soon, for it often evolves as anger. Oddly enough, it appears too frequently during preflight. Watch the pilot who "chews" the crew chief, or becomes upset with the command post and their dumb questions. Does Foxtrot, the tower or ATC controller get him uptight? The follow-on to this is normally an attitude of belligerence. Now you have a potential high risk situation, watch out! A classic example we have all seen is the driver who overtakes a slow truck on crooked roads, the driver's anger level increases with the length of time he follows the truck. Very soon he will resort to a high risk pass, normally cutting back in close to insure the truck driver is aware of his dislike for slowpokes. That is assuming he completes his high risk pass.

Another emotion which can influence your ability to fly safely is fear. This is an unpleasant, often strong emotion caused by expectation or awareness of danger. The level of fear is often directly related to experience and knowledge. Experience requires time; knowledge is obtained through study. Study. Be like Jonathan Livingston Seagull, learn and your experience level will increase without as many terrifying events.

Knowledge certainly comes from learning the limitations in the book, but don't stop there. Try to learn the whys of systems. There is a vast amount of knowledge that has yet to find its way into the Dash-One. Take, for instance, the very basic aerodynamics of the B-52. Two cases involving lack of understanding of the B-52 design come to mind.

On a flight involving an "H" model, the pilot went downstairs for relief and the copilot was monitoring the autopilot. Classic, the navigator asked for a speed reduction which the copilot honored by retarding the throttles. Of course, center then called for flight routing. The copilot was talking to center and getting information from the navigator. The aircraft meanwhile trimmed itself into a stall and disengaged the autopilot. Recognizing a stall, the copilot advanced power to the thrust gate and descended from FL 350 to 17,000 in a power-on stall before the pilot got into the seat and recovered the aircraft. Believe it or not, no one ejected. Second case — a B-52 lost airspeed information and entered a low speed stall. The crew was unable to recover and bailed out. There was one fatality and the other crewmembers completed their mission via Navy sub.

What would have saved the day for both of these crews doesn't appear in the Dash-One, i.e., setting the trim! Remember, the man designing the aircraft had finished his task before the guy with the airspeed indicator ever arrived. The aircraft was perfectly capable of flight without the instruments. Think about why the aircraft has a trim system. Simply to give it an airspeed envelope, or to go fast or slow if you prefer. Otherwise it would be like a glider and always fly at best lift over drag. Now if you don't know what your airspeed is (loss of indicators) best lift over drag is a very good place to be, right. Okay, for the B-52, .8 nose down is very close to this value. Therefore, set .8 nose down and trim with power, i.e., add power to stop a descent and reduce power to stop a climb.

Yes, Virginia, there is a Santa Claus. You can land the B-52 with airspeed failure. You must understand aerodynamics and what the various systems, i.e., flaps, gear and airbrakes do to trim requirements. Turns out they balance pretty good. If you must land without airspeed, reduce your weight at altitude. Accomplish this by flying around with the trim set at .8 nose down and either leave the aircraft clean (preferred) or extend the gear and raise the airbrakes to two. Do not attempt to increase drag past this point. At 270,000 pounds or less (250,000 pounds preferred) gross weight start a straight in descent from altitude, distance should be twice your altitude plus five miles, for example, from FL 200, use 45 miles. Start the descent using gear down and airbrakes two and retard the throttles to idle. At 10,000 feet above the terrain, leave throttles at idle and use back elevator to obtain level flight. When level start the flaps down and place airbrakes to zero (trim still at .8 ND). Release back pressure and allow the aircraft to descend until approaching glide slope interception, maintain glide slope with power. Elevator forces will change airspeed. As the aircraft crosses the threshold, establish attitude with the elevator, reduce power to idle and trim with airbrakes, in increments of two. The aircraft should touch down, trim at .8 ND, throttles idle, and airbrakes six. In case of go-around, advance throttles, lower airbrakes and power trim to desired rate of climb. (Note: When making turns, the nose will attempt to fall. This must be trimmed with power. Indicated airspeed will increase in turns but this offsets the loss of lift or increased stall speed.)

Ready for more about limitations? How about landing on wet runways? Hydroplaning will cause a B-52's brakes to go to the parked mode and lock all wheels with the antiskid switch on. Didn't know that, huh? True, it has happened. A B-52 touched down on a wet runway within the first thousand feet, chute failed and the aircraft stopped in the mud

Continued on page 19

BIG INSTRUMENT

HAPPENINGS

Captain Lewis M. Hatch
1st Combat Evaluation Group
Barksdale AFB, Louisiana

Editor's Note — This month marks the eighth anniversary of the "Big Instrument." Since October 1970, "Big I" has appeared in 88 issues of "Combat Crew" (an average of 11 times per year) and has covered a wide spectrum of instrument flying topics. We would like to thank the contributors of these articles for their time, effort, and contribution to safe instrument flying. Although the rank may have changed, you will probably recognize some of these names from around the command: Maj R. R. Brown, Maj R. D. Furman, Maj William E. Baker, Maj John C. Bonnette, Maj Emory M. Strong, Jr., Capt William B. Davitte, Maj J. L. Sandberg, Capt Ronald R. Simonetti, Maj C. M. Millar, Capt Robin P. Collord, Capt John L. Wilson, Capt Theron L. Sims, Maj Jon T. Martin, Capt Stephen E. Smaby, Maj Walt LaGrone, Capt Lewis M. Hatch, Maj Dennis D. Carpenter, Maj Donald F. Allan, Capt Tome H. Walters, Jr., Capt James M. Sullivan.

NEW PROGRAMS

Five new instrument related audiovisual programs have been produced by the 4235 ISDS during the past year. Two of these programs were produced for the SAC Hangar Flying program, while three others were produced as part of the Annual Instrument Refresher Course or Navigator Weather Criteria and TERPS Training program. The program manager responsible for production of all five of the programs is Major Don Rapuzzi. Prior to his arrival at the 4235 ISDS last summer, Don spent several years assigned as an academic and flight instructor at the USAF Instrument Pilot Instructor School (IPIS) at Randolph AFB. His expertise in the area of instrument flight has been invaluable in the production of these programs.

The programs produced as part of the Hangar Flying program were videotapes entitled "Low Visibility Landings" (Hangar Flying #6) and "Low Level Windshear" (Hangar Flying #7). The "Low Visibility Landings" tape features segments of an FAA film showing cockpit footage of various hazards inherent in landing under low visibility conditions. Each of the segments is narrated and discussed by two experienced instrument flight instructors. The "Low Level Windshear" tape features two former IPIS instructors presenting a description of the phenomenon and its hazards, as well as some methods for detecting and coping with low level windshear. Both tapes are of excellent quality and have been selected by Headquarters USAF for Air Force-wide dissemination.

A third videotape, "Enroute Weather," was produced as part of the new Annual Instrument Refresher Course now under construction. The tape is narrated by a former IPIS weather instructor and author of AFM 51-12 ("Weather for Aircrews"). The outstanding quality and content of this program has resulted in its selection by the Aerospace Audio Visual Service as the best audiovisual program produced throughout the Air Force during the month of May. Congratulations to everyone involved in its production.

The remaining two programs are sound-slide productions for the Navigator Weather Criteria and TERPS training program. These consist of a revised Part 2 and a new Part 3 and should be available in your unit by the time this article is published. The combined total run time for these programs is slightly under one hour and they offer an excellent review of approach procedures charts for both pilots and navigators.

If you have not had the opportunity to view any of these programs, I strongly recommend you take a look at them. They're excellent.

NEW AIRC

As many of you already know, a new SAC Annual Instrument Refresher Course (AIRC) has been under construction for almost a year. The program will be a radical departure from the existing program in that it will be presented in a "flight profile" format and will deal extensively with instrument procedures and techniques. Regulations and publications will be covered only as they relate to instrument flight and within the particular phase of flight to which they apply. As in the past, the program will allow the instructor to tailor the course to the needs of his unit. Instructor outlines have been completed and the entire training package will be sent to the field as soon as production of new visual aids is completed.

COMING SOON

A revision to AFM 51-37 has recently been sent to the MAJCOMs for review and approval. It will be published as an entire manual, rather than a change, and should be ready for publication in the near future. As soon as the new manual is released, we will publish a "Big Instrument" article reviewing major changes.

Grampa's Thoughts . . .

Continued from page 17

13,000 feet later. Why? Okay, first get out the book and find the hydroplaning chart. Note that hydroplaning speeds are lower for takeoff than for landing. This is because of the power effects during takeoff. Same thing happens with a ski boat.

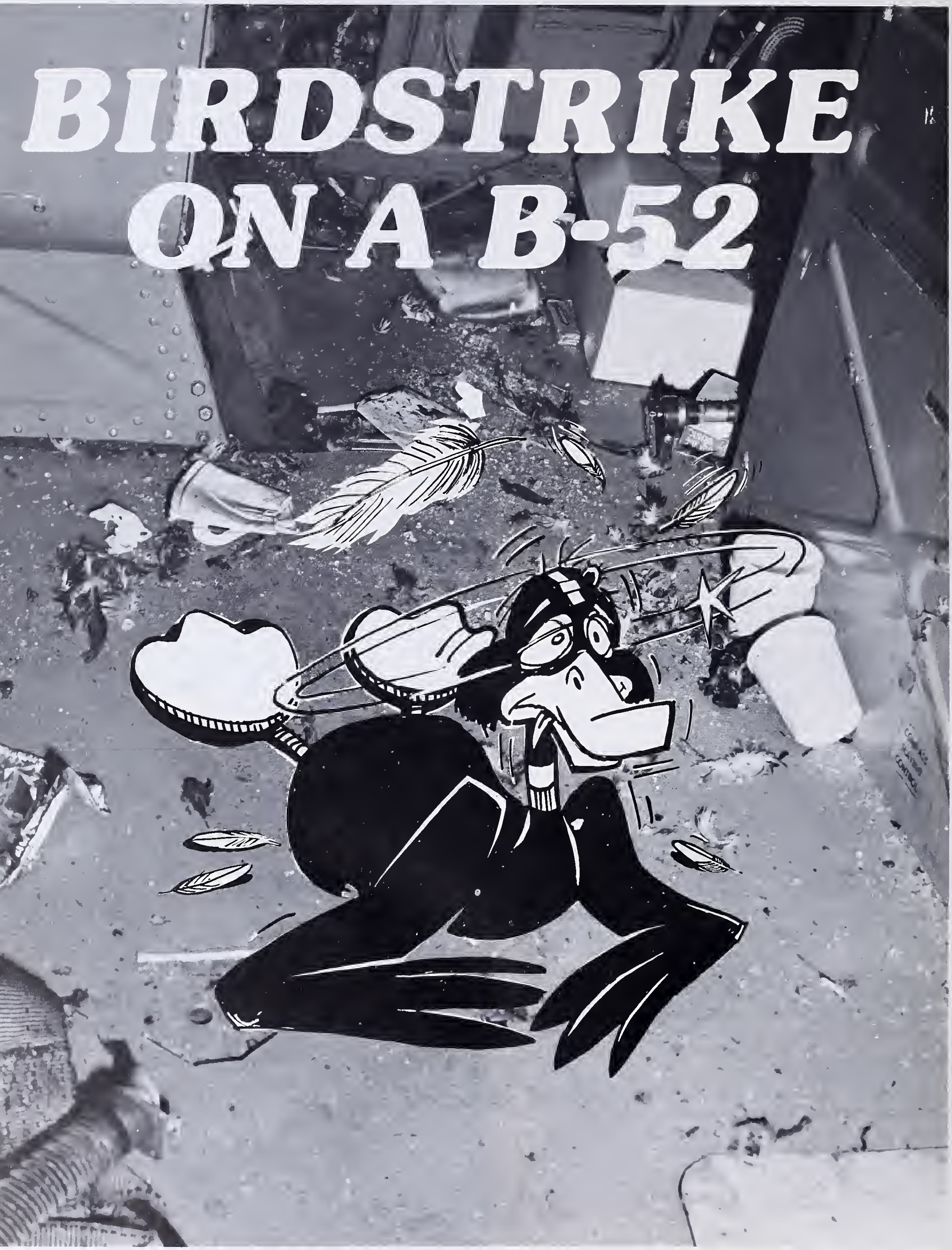
In a hydroplaning situation, the tires rotate backwards. Your safety guys should have a film on this. A phenomena called "braked wheel ratcheting" occurs, the brake stops the wheel and the antiskid releases it. However, it rotates backwards again and the antiskid commentators do not sense a forward rotation (need six to nine knots) and they assume the aircraft has parked. The wheels are now locked with the antiskid system operating normal. This is seldom a problem with the B-52 as we normally touch down, deploy the chute and check the brakes at 90 knots which is below hydroplaning speed on landing. The trouble begins when the pilot expects a slick runway and applies the brakes before the aircraft is below total hydroplaning speeds. Should he experience chute failure, he really gets on the binders, and then if he thinks nothing is slowing him, he cuts the antiskid off in desperation.

Now that you know this, have the copilot look up the hydroplaning speed for takeoff and again before landing. If your abort speed is greater than your hydroplaning speed, you can either reduce the abort speed or expect to explore parts of the airfield you never thought you'd see. The best procedure in either an abort attempt or landing is to reduce the power (min landing procedures for your model), deploy the chute, and if you don't feel the antiskid cycling, release the brakes for wheel spin-up and then reapply. Do not turn off the antiskid, give it a chance to work.

Is there still more? Yes, I am afraid so. Strangely enough the B-52 takeoff data does not include the braking energy limits. Want to know what can happen? Compute a normal takeoff using 425,000 pounds to 460,000 pounds, a 60-degree or better day and a decision distance of 5000 feet. Now assume the abort occurs at S1 speed and look at the brake energy charts. Scarey, huh? Even if the brakes didn't fail before the aircraft stopped, you are just about guaranteed a good brake fire before the crew can get out.

Get the idea? Read, study and ask questions. Use the simulator. Find yourself a dedicated old guy and get him to tell some of his war stories. When someone tells you something, question the whys. The B-52 is probably the safest aircraft ever built. However, it is not idiot proof. What you learn and your attitude while operating it will ultimately determine its safety.

BIRDSTRIKE ON A B-52



The following is an account by Capt Platt of a bird strike in a B-52H. Capt Platt is the aircraft commander of crew E-63, 37th Bomb Squadron. Other crewmembers were 1Lt Fred Wuertle, copilot; Maj Michael Depaul, safety observer; 1Lt David Moxon, radar navigator; 1Lt Raymond F. Tischer, navigator; 1Lt Stuart Kellogg, EWO; and SSgt Richard Agopsowicz, gunner.

Capt John G. Platt
37 Bomb Sq, Ellsworth AFB

On March 27th, my crew participated in the Busy Razorback exercise, 15th Air Force's biannual bombing exercise. Takeoff, departure, joinup and the high altitude STR run went well. Following this activity, we began preparing for the low level runs.

Running the low level descent checklist, my mind went back to a 60-4 evaluation I received on this low level route last fall. The evaluator emphasized the importance of visors during low altitude flight. The copilot and I checked our visors down prior to leveling off at IFR altitude and turned on the hot mic interphone to aid cross cockpit communication.

The copilot kept me advised of course alignment, timing points and occasionally mentioned some bird sightings enroute. The aircraft was flying well and the bombing navigation system seemed to be really tight. During the short flight between OB routes, the air route traffic control center advised that previous aircraft had reported bird sightings in the OB-53 low level route. I directed the IP and other forward-facing crewmembers to make sure their visors were down. We entered OB-53 and initiated terrain avoidance flight. We spotted a flock of birds prior to commencing our last STR run.

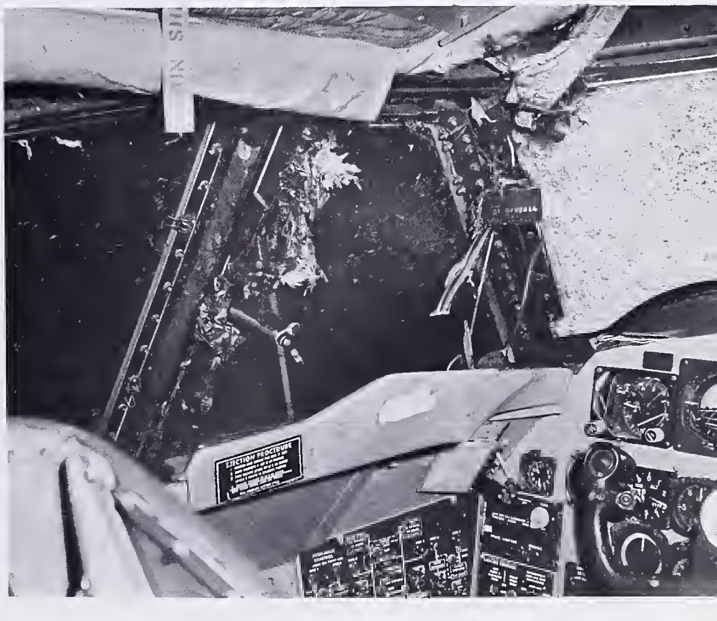
After rolling out on our last release heading the copilot made some indistinct noise and I noticed his head dropping. I looked at the number two left window to find it filled by a bird whose wingspan exceeded the dimensions of the window frame. I attempted to duck but impact was instantaneous.

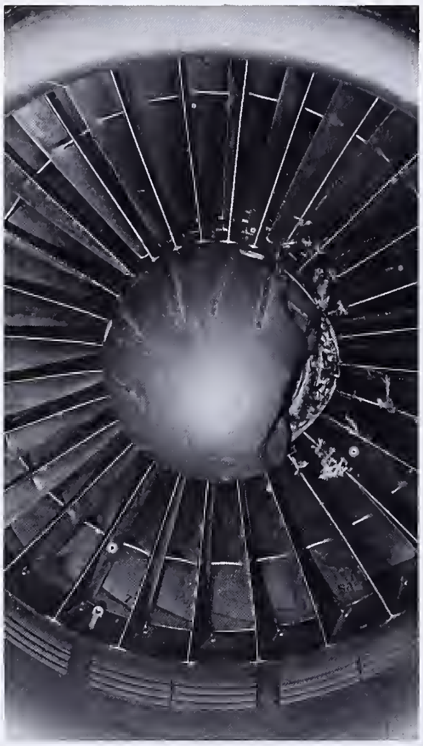
The bird impacted below the windshield wiper and part of it came in under the window frame and hit the back of the pilot's instrument panel. The impact broke off the horizontal situation indicator where it joined the instrument panel and it fell back into the panel. The impact caused the pilot's attitude indicator to fail, EVS monitor to shut down, and the altimeter face to pop off.

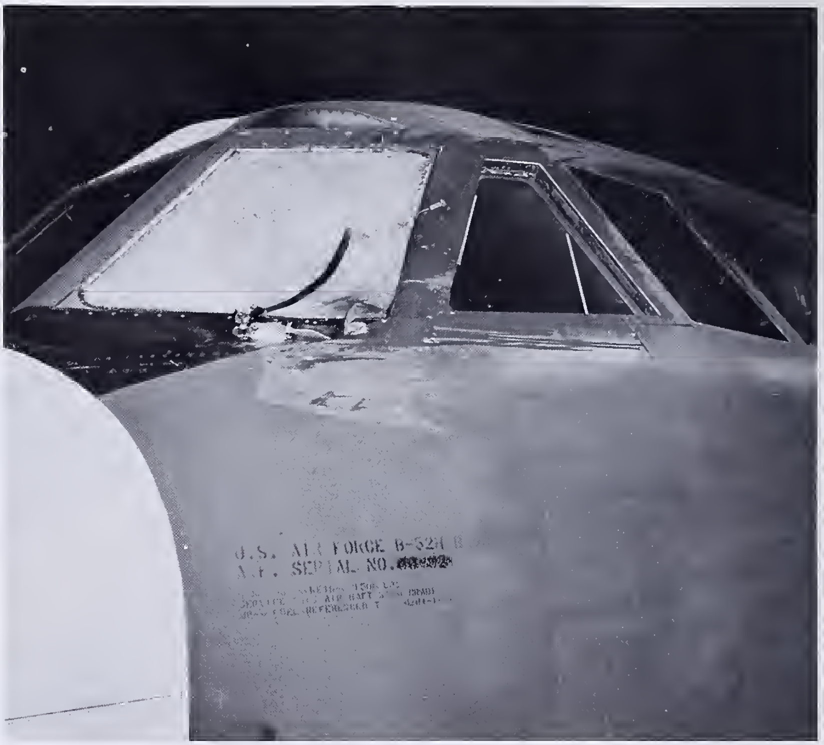
A second large piece of bird was extruding through the left edge of the number two window. This caused the load bearing pane to shatter and the window to separate from the bottom of the windscreen. The mass also struck the forward edge of the number three window frame. The deflected and disintegrating mass impacted my helmet, mask and upper body. Although I received secondary impact, the collision forces were substantial. My head was thrown violently against the headrest and then bounced forward on recoil. The bird mass and shattered glass coated my upper body with about a half-inch of debris. This covering turned my visor opaque, blinding me.

My first thought was that the aircraft was at terrain avoidance altitude or below! Crew survival depended on getting the aircraft away from the ground. I pulled the control column to a position aft of neutral and attempted to lock my arm in that position, until I could either get the copilot to take the aircraft or I could engage the autopilot.

I informed the copilot he had the aircraft and awaited his response. I was relieved when he replied "I've got it." He advanced the power and continued the climb.







The next thing he said, I wasn't prepared for. He asked, "What should I do?"

I realized that he needed guidance and the pat answer, "Fly the aircraft," would not do. I needed time to analyze our situation and get myself together. I responded, "Slow the aircraft to 250 KIAS and continue the bomb run." He set about the task at hand while I informed the safety observer that I was blind.

The safety observer realized that the matter covering my visor was blinding me. He pulled my head towards him and wiped my visor. Once my vision returned, things improved. We declared an emergency, climbed to 10,000 feet and requested radar vectors direct to Ellsworth. The entire crew was now actively involved in our recovery. We performed a controllability check upon reaching the local area. The aircraft behaved well but the number three engine compressor stalled while rolling into or out of a turn. Due to our proximity to the airfield, I elected to leave it running but reduced it to idle thrust.

The pilot's instruments were damaged to the extent that flying an approach would require a cross-cockpit instrument check. We, therefore, elected to have the copilot fly the approach and accomplish the landing. His vision was restricted to the center window and the right side of the aircraft. He accomplished the precision approach followed by the best landing he's ever made. We taxied clear of the runway and shut down.

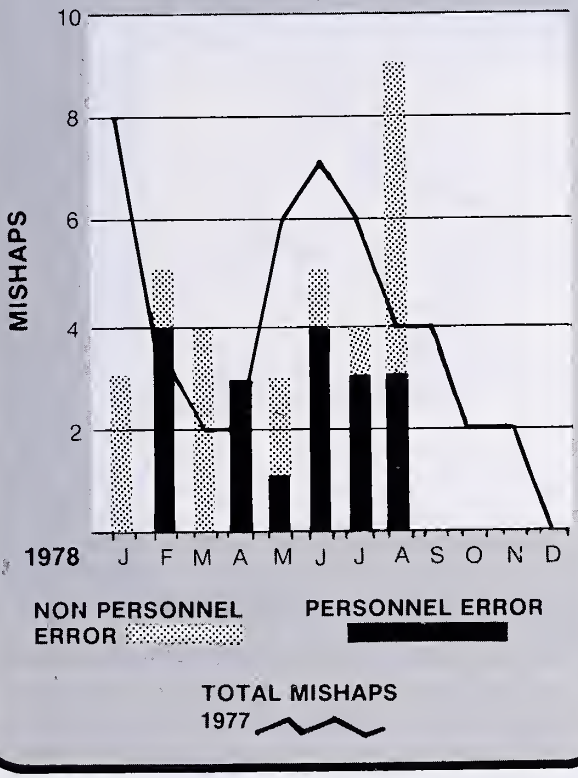
We learned several lessons from this experience. First, large birds, in this case a nine to fifteen pound Canadian goose, cause major aircraft damage. Even with active clearing of the aircraft flight path chances of seeing a bird of this size in time to avoid it are minimal. While a direct blow could have undoubtedly been fatal, having my helmet on, visor down, and oxygen mask on as a minimum, saved my vision if not my life! The entire cockpit area was filled with disintegrated goose and glass.

Secondly, use the hot mic interphone if available. It provided us with instantaneous communication capability during the first critical moments of the emergency. However, it does have a drawback. Other crewmembers may not be aware of what's going on. If you use it, develop a technique to assure the rest of the crew is informed of your status in the event of a problem.

Good crew coordination really pays off when things get tough. The safe recovery of this aircraft was accomplished by the coordinated effort of my entire crew.

Missile Mishap Report

DOD CLASS A, B and C



QC's COMING During a Minuteman missile guidance (MGS) removal, the maintenance team failed to remove all the bolts that held the MGS to the third stage of the missile. This mishap caused considerable damage to three mating holes and the metal mating rings on the missile and MGS. During the investigation the team chief stated that he was in a hurry since quality control (QC) was enroute to his site for a no-notice inspection. Why was the team chief rushing since QC was on the road? If all of us followed tech data all the time, we would know what the tech data said and how to perform our jobs in the same professional manner with or without observers. The end result of this mishap was a complete missile recycle, many lost man-hours and dollars spent to place the sortie back on alert.

CORRODED MISSILE Recently an AGM-69A failed to power-up following uploading. Removal of the electronics section shell revealed extensive corrosion on electronics components. Further disassembly revealed extensive corrosion in other areas. Moisture entered at the mating surface between the electronic section shell and guidance assembly. This area was void of any environmental sealant. Other areas were found with insufficient sealant or old sealant that was never replaced during reassembly. It is our responsibility to follow tech data and sealing procedures to prevent corrosion to expensive weapon systems.

DAMAGED TRANSPORTER-ERECTOR A missile handling team was not briefed on the configuration of a transporter-erector container (TEC) prior to operating it at the proofload test facility. Additionally, the team chief did not know the status of the equipment his team was to operate. As a result, quick release pins were not removed prior to extending the actuators. The actuators were extended and damage of $2,000.00 occurred to the TEC.

Know the status and configuration of your equipment prior to beginning any task, and double-check work done by previous crews. A little time spent double-checking your equipment can save a lot of time explaining why you "broke it."

TORN GLOVE MISHAP A team chief exited the launcher with the KS-2 emergency fan switch turned off. The team chief was wearing leather gloves with ripped finger seams. He stated he turned the switch on but did not visually confirm this; as he removed his hand from the switch, the torn glove possibly caught on the key. He pulled his hand free and moved on to the next check without visually or manually rechecking the KS-2 switch position. Four days later power supply drawers failed due to loss of cooling air with the site on emergency power. Wearing gloves when throwing small switches is not a good maintenance practice (except when required by tech data), but not double-checking the positions of critical switches when doubt exists is an unsatisfactory maintenance practice. Possibly one torn glove cost the Air Force $2,000.00

OPS HAZARDS

Within two days, SAC experienced two KC-135 class B mishaps involving extensive damage to both an engine and the associated strut. Both cases involved sudden engine failure shortly after takeoff and in one instance, the engine separated from the aircraft.

The first case involved a crew making a day takeoff on an EWO profile training sortie. There was no evidence of engine problems during the preflight, start, or taxi out. The fuel load was 103M and the gross weight was 216M. The weather was good with a temperature of 82 degrees and dew point of 67 degrees.

Water injection was started and throttles advanced for the rolling takeoff. All was normal through flap retraction and acceleration to climb speed. Speed was about 250 KIAS and the aircraft was entering a required turn when the pilot felt a sharp vibration from the number three throttle. Other crewmembers heard a bang or thud. All number three engine instruments began unwinding rapidly followed by a dim fire warning light and then generator failure.

The boom operator was sent aft for a visual inspection. He reported the engine had separated and there was no visible fire. The command post was notified. Gross weight was adjusted and a controllability check was performed prior to an uneventful landing.

Damage was extensive to the engine and strut, but there were also numerous holes and dents in the wing areas. The engine was recovered from a farmer's field and inspected by engineers. They determined that the combustion chamber outer case had cracked and blew out at the one o'clock position. A piece then severed the strut lower spar causing the engine's turbine to seize with the resulting torque and buckling causing engine separation.

It was also determined the crack had existed for some time and was near a horizontal weld at the one o'clock position. A comparison was made with two past similar mishaps. In both cases, the horizontal case weld was in the one o'clock position. However, it was determined that case failure would have still occurred due to the crack, but the engine would not have separated if the weld had been in a lower position.

Recommendations were made to locate engines with horizontal welds and insure this weld is not in the nine to three o'clock positions. Also, better engine combustion case inspections should be performed during overhaul to locate cracks.

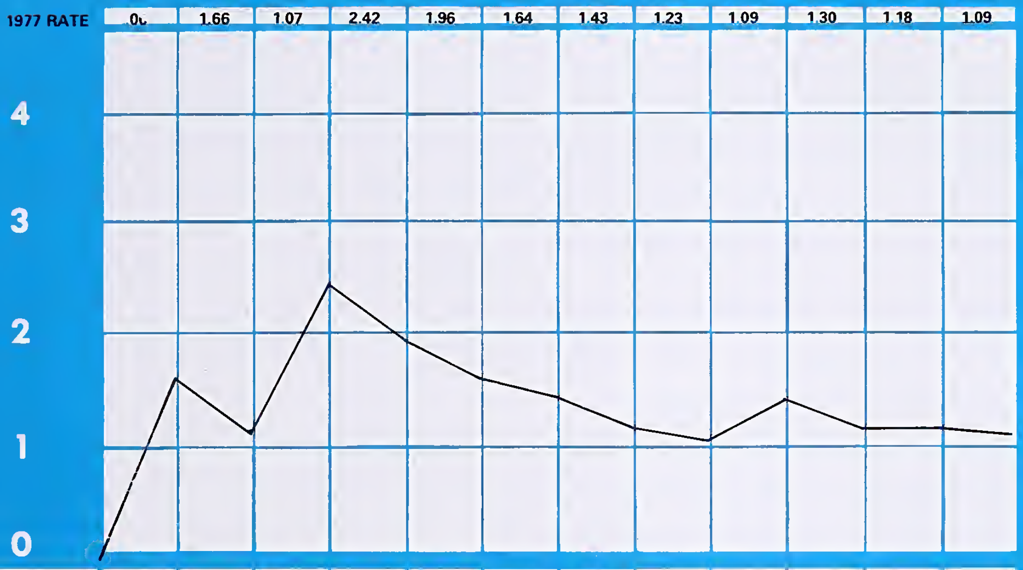
The second case involved a tanker just airborne during a night takeoff. At 600 feet AGL the crew heard a loud bang and saw a flash from number one engine. The EGT was increasing with decreasing RPM and oil pressure. The crew immediately shut the engine down and sent the boom operator back for a visual check. He reported no fire but did find the overwing hatch ajar.

A Hotel Conference was convened and an uneventful landing was made. Post landing inspection revealed that the engine had rotated 10 to 20 degrees outboard shearing the inboard mounting bolt. The engine casing had not been penetrated, but there was extensive damage to the N-1 compressor.

In both of these cases the crews did an outstanding job handling tough situations.

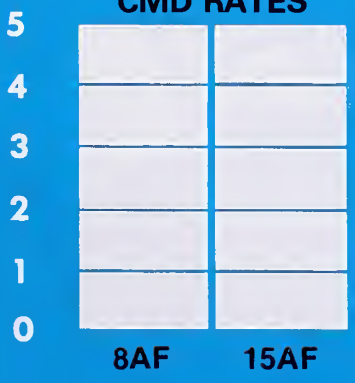
1978 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1977	0	1	0	2	0	0	0	0	0	1	0	0
1978	0	0	0	0	0	0	0	0	0			

1978 SUBORDINATE CMD RATES



LEGEND ⁀ =1977 RATE

MISHAP STATUS

ACE TOPICS

THE VALUE OF ACE — Flying solo in T-37 and "Team" (two copilots) in T-38 aircraft, SAC copilots are gaining valuable experience performing in roles as aircraft commanders. The ACE program presents the young copilot with unsurpassed opportunities to hone filying skills, strengthen judgment, and develop maturity through exposure to increased responsibility. The program adds another dimension to copitol duties and forms a strong foundation for future rigors as B-52/KC-135 aircraft commanders.

Prior UPT experience with T-37/T-38 aircraft enables copilots to qualify for local area solo or team sorties in a minimum amount of time. Copilot familiarity with these systems means comparatively little is invested in sunk costs before benefits of the program are realized. Upon completion of qualification and instrument check rides, copilots are soon free to fly unsupervised to practically any airfield in the CONUS.

Such freedom, however, carries with it a commensurate amount of responsibility. Herein lies the heart of the ACE program. The safe and successful completion of the mission becomes the responsibility of the individual copilot. Diminished supervision makes each sortie a decision making exercise from start to finish. Copilots become less complacent and soon develop a vigilant attitude towards flying safety. Each sortie adds a sense of personal accomplishment and builds confidence in flying ability. The result is a more mature and responsible copilot who develops his ability to make decisions correctly by comparison of facts and ideas.

Strange field approaches, often in high density air traffic areas, present new demands on a copilot's flying judgment. It requires greater attention to detail in mission planning and strong air discipline during enroute and arrival phases of flight. Responsibility for the aircraft does not end with engine shutdown. Copilots must insure that transient alert crews perform proper servicing and coordinate any necessary maintenance. Decisions of a "go-no go" nature must often be made when continuing the mission is affected by degraded equipment. Much of this type of exposure is totally new and sometimes intimidating. We all make mistakes and sometimes swallow a little pride but become much wiser.

In a comparative sense, ACE is a cost effective program. T-37/T-38 aircraft use much less fuel and have lower operating costs per flying hour than either the B-52 or KC-135. And though flight characteristics between these aircraft may differ, the instrument approaches flown and environment in which all aircraft operate do not. Similar instrumentation between cockpits enhances flying proficiency and facilitates transition from one aircraft to the next. A larger amount of similar training can be accomplished at much less expense.

Captain John H. Wayne, Jr.
5th Bomb Wing, Minot AFB

FIREPROOFING THE BOD — Burns are absolutely the most painful of survivable injuries. With very little effort, you can prevent or at least minimize burn injuries received in an accident. Most of the "fireproofing" effort can be accomplished first thing in the morning when getting dressed. We affluent capitalists are provided with expensive Nomex flying suits which are certain to protect us in event of fire, right? Well, while the Nomex itself will not burn, it makes a dandy wick when soaked with fuel resulting in a very impressive candle. The Nomex offers little insulation on its own and will eventually melt, making you look like one of those critters from close encounters. It's a good habit to wear some form of insulation between the Nomex and the skin. Your best bet would be a set of those nifty Nomex long handles but a good compromise in the summer is a pair of plain old cotton shorts with a round neck T-shirt. This protects about 60% of your body.

When going out to fly, tighten up the Velcro on your sleeves (Yes, leave them down) and zip shut the legs on your zoom bag. Next, turn up the collar for protection around the neck and that stylish Fonz image. If you like zippers in your boots, ensure there is a flap between the zipper and your foot. Metal is an excellent heat conductor and you could wind up with a scar that looks like you trim your toenails with a chain saw.

The Nomex jacket offers the best protection when conditions permit its use. A summerweight Nomex jacket is in the works 'cause the nylon one we now use burns like crazy when its ignition temperature is reached. Both jackets will offer some benefit in the way of insulation, however.

A fire encountered when airborne is simple to deal with (just jettison the aircraft). Dealing with a fire on the ground requires preplanning. The time that your engines are least happy is starting, so if you like your looks you will lower both visors and keep the mask on during this period. With your mask on you can prevent inhalation of flame and there is little danger of burns from oxygen IF THE REGULATOR IS IN NORMAL. On the ground you breathe mostly ambient air if you are not on 100%.

Make a habit of practicing your ground egress from time to time after shutting down in the chocks. (This usually blows the crew chief's mind but is an easy way to beat the stud out of a coke.) Being able to egress on reflex action is useful under pain or other stressful situations.

Most early aviators (before parachutes) carried revolvers to use on themselves in the event of a "flamer," or fire in the cockpit during combat. A little common sense and perhaps a slight inconvenience now could be the most important thing you've done in your life.

Captain Lawson
64 FTW, Reese AFBTX

PROFESSIONAL PERFORMERS

Individuals selected for these pages as SAC's top professional performers of the month are chosen from nominations made by all SAC units. Selection is made only after all nominations have been carefully screened and those chosen meet the highest standards of excellence outlined in SACR 127-2.

MSgt Robert L. Gilmore, 43d MMS, Andersen AFB

A1C Marco A. Reyes, 28th OMS, Ellsworth AFB

MAINTENANCE MEN

MSgt Robert L. Gilmore, 43d MMS, Andersen AFB, earned this award for outstanding leadership, initiative, and technical competence. Sgt Gilmore has been instrumental in saving thousands of dollars through his innovative techniques. He developed new corrosion control procedures for cleaning and preserving of arming wire; these procedures are being incorporated into technical data for use Air Force wide. He was co-designer of a Vacu-Blast adapter that will save over $75,000 in materials and virtually eliminate the environmental health hazard associated with the use of this equipment as well.

A1C Marco A. Reyes, 28th OMS, Ellsworth AFB, is recognized for his initiative and outstanding job performance. His ingenuity aided immensely in formulating an apparatus which facilitated aircraft air conditioner servicing. He also developed equipment which enhances the procedures for draining and servicing B-52H main landing gear struts. Airman Reyes has become proficient in all four B-52H phase inspection areas. Through his efforts the phase dock floor was resurfaced and anti-skid protection implemented in work areas. His watchful attitude and concern have contributed significantly to improved safety practices.

FB-111 crew, 380 Bombardment Wing, Plattsburgh AFB: Capt George A. Davies, Jr., IP; and Capt James H. Ferrell, P.

FLYING CREW

FB-111 crew Captain George A. Davies, Jr., IP, and Captain James H. Ferrell, P, of the 380th Bomb Wing had progressed in their mission to level off. During cruise flight, however, the aircraft roll axis was very difficult to trim and the autopilot was inoperative. Air refueling was normal until reaching the end of the refueling track. At that time, icing conditions were encountered at FL 190. Manual anti-ice was selected and the cabin altitude fluctuated plus/minus 6000 feet. A descent was initiated to 17,000 feet MSL for a flight control demonstration and return to home station for transition. Approximately 150 miles from their destination, while straight and level, the aircraft yawed violently 25 degrees right and rolled into a 30 degree bank while pitching down 20 degrees. Numerous warning and caution lights illuminated as aircraft control was regained. The yaw damper was immediately turned off, but the hard-over type maneuvers continued. Placing all dampers and other associated flight equipment to the off position did not affect the unscheduled inputs. The flight control disconnect switch was placed to override with no results. The aircraft was descended to 13,000 MSL and configured for a 16 degree wing landing with full flaps and slats. A controllability check was accomplished at this time. The unscheduled maneuvers occurred several times after the aircraft was configured and during the enroute descent. A long straight-in final approach with a minimum amount of turns was planned. On final approach, airspeed was reduced to 160 KIAS (136 KIAS was the computed approach speed). At this speed, aircraft control was marginal in response to normal pilot inputs. Airspeed was increased to optimum using a pattern to avoid overflying densely populated areas. The crew managed a safe landing demonstrating professionalism and competence that contributed to the saving of a valuable aircraft.

MINUTEMAN CREW

Shortly after crew changeover, Minuteman Crew R-012 received a misauthentication from a maintenance team chief during a follow-on entry. As directed by SACR 207-16, the crew contacted the assistant team chief and again received an incorrect authentication. This led the crew to declare a Helping Hand security situation 3A. The following day, after coordinating with wing job control, maintenance teams shut down two sites simultaneously, resulting in unexpected isolation of the flight from other flights. After conferring with job control a time slot transfer was made. However, it was then learned that their missiles could not be monitored. The crew realized they were in uncoordinated Single Flight Operation (SFO) status. They quickly conferred with job control and directed other flights to run Sensitive Command Network Tests. The failure of these tests proved Lts Day and Baugh to be correct. The crew then recovered its own time slot and declared security situation 2D for all the sorties in its flight. Shortly, Lts Day and Baugh were informed of a mishap. A gas actuator had exploded, causing lacerations to a maintenance team member. The crew quickly contacted job control and the command post and made provisions for a local sheriff to proceed to the site and move the injured airman to an area where a helicopter could transport him to the Malmstrom AFB hospital. The professional actions of Lts Day and Baugh during this event-filled alert demonstrate their value to the wing and the Air Force alike.

MINUTEMAN Crew R-012, 341 Strategic Missile Wing, Malmstrom AFB: MCCC 1Lt Richard L. Day, and DMCCC 2Lt Daniel W. Baugh.

TITAN

Titan Crew S-203 displayed outstanding professionalism and superb technical skill in correcting an extremely dangerous condition. The crew had successfully supervised removing the reentry vehicle, the preparations for off-loading the oxidizer, and had sent a safety inspection team into the launch duct. Suddenly the crew noticed "Vapor Oxi Pump Room" followed by "Oxi Vapor Launch Duct" flashing and "Vapor Silo Equip Area" lighted on the console. The crew, realizing the danger to the team in the launch duct and to other maintenance personnel topside, quickly and calmly entered the hazard checklist. Outstanding crew coordination was exhibited as the crew monitored the safe evacuation of the personnel in danger while at the same time relaying critical information to the command post. In addition, the crew commander sent his BMAT and BMFT topside to sample the vapor concentration rising from the exhaust shaft and to determine if it would affect the local area. Using tech data and coordinating the assistance of maintenance personnel, Captain Lee and his crew determined that an oxidizer back pressure regulator had malfunctioned. As a direct result of the crew's quick diagnosis of the problem, the malfunctioning unit was replaced before the vapor concentration reached toxic levels.

TITAN Crew S-203, 390 Strategic Missile Wing, Davis-Monthan AFB: MCCC Capt Melvin K. F. Lee, DMCCC 2Lt Richard E. Holley, Jr., BMAT SSgt Clarence J. Matias, and BMFT SSgt Thomas J. Ostrum.

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-TWO YEARS

170 AREFG, McGuire (NJANG)	NONE

OVER TWENTY YEARS

171 AREFW, Greater Pittsburgh (PAANG)	Mar '58
157 AREFG, Pease (NHANG)	Jun '58
97 BMW, Blytheville	Aug '58

OVER NINETEEN YEARS

940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59

OVER SEVENTEEN YEARS

19 BMW, Robins	Oct '60
151 AREFG, Salt Lake City (UTANG)	Feb '61
161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61

OVER SIXTEEN YEARS

340 AREFG, Altus	Feb '62
301 AREFW, Rickenbacker	Jul '62
96 BMW, Dyess	Aug '62

OVER THIRTEEN YEARS

160 AREFG, Rickenbacker (OHANG)	Dec '64
320 BMW, Mather	Jul '65
452 AREFW, March (USAFR)	Sep '66

OVER ELEVEN YEARS

92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67

OVER TEN YEARS

319 BMW, Grand Forks	Dec '67
22 BMW, March	Feb '68

OVER NINE YEARS

5 BMW, Minot	Feb '69
42 BMW, Loring	Sep '69

OVER EIGHT YEARS

141 AREFW, Fairchild (WAANG)	Oct '69
28 BMW, Ellsworth	May '70

OVER SIX YEARS

7 BMW, Carswell	Mar '72
101 AREFW, Bangor (MEANG)	Mar '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72

OVER FIVE YEARS

376 SW, Kadena	Nov '72
379 BMW, Wurtsmith	Apr '73

OVER FOUR YEARS

384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74

ICBM

OVER FOURTEEN YEARS

90 SMW, F E Warren	Jul '64
1 STRAD, Vandenberg	Sep '64

OVER THIRTEEN YEARS

308 SMW, Little Rock	Aug '65

OVER EIGHT YEARS

341 SMW, Malmstrom	Apr '70

OVER FIVE YEARS

390 SMW, Davis-Monthan	Jul '73

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

SAC SAFETY SCREEN

509 BMW, Pease Crew S-31: P Capt Francis J. McHugh, RN Capt George Bayles

416 BMW, Griffiss Crew R-110: FP Capt William J. Saettel, CP 1Lt Patrick K. McCaffry, NN 1Lt Gilbert D. Hernandez, BO Sgt Bruce F. Parent

69 BMS, Loring Crew E-18: P Capt Donald A. Domain, CP Capt Rodney G. Templeton, RN Capt Larry D. Hamon, N 1Lt John T. White, EWO Capt Richard P. Thomas, G AIC Jerry A. Waite

42 AREFS, Loring Crew E-118: P Capt Thor V. Gunnarsson, CP 1Lt James W. Hunt, N Capt Richad W. Gilchrist, BO AIC Donald P. Reed

407 AREFS, Loring Crew S-152: P Capt Stephen L. Heyroth, CP 1Lt Dennis W. Anderson, N Capt Lee F. Hardeman, BO SSgt Joseph T. Leiss

644 BMS, K. I. Sawyer Crew E-22: P Capt James C. Berg, CP Capt Larry W. Butler, RN Capt Steven L. Hansen, N 2Lt Bruce A. Lasater, EWO 1Lt Daniel B. McGuinness, G. TSgt John R. Lowery

46 AREFS, K. I. Sawyer Crew S-103: P Capt Steven F. Waiss, CP Capt William G. Jinks, N Capt Randolph W. Gallas, BO TSgt Alan R. Bekkerus

376 SW, Kadena Crew E-105: P Capt Danny J. Bartel, CP Capt Kenneth J. Riley, CP 2Lt Thomas J. Montgomery, NN 1Lt Frank A. Lassus, BO SrA John C. Alvarez

9 SRW, Beal Crew E-67: P Capt Thom F. Evans

320 BMW, Mather Crew E-07: P Capt Bevley E. Foster, CP 1Lt David Weaver, RN Capt Joseph E. Kraynik, N Capt Donald Simpson, EWO 1Lt Christopher G. Wheeler, G TSgt Layton E. Payne

96 BMW, Dyess Crew E-104: P Capt Kenneth L. Black, CP Capt William A. Hendrex, N Capt Jerry M. Cryer, BO SSgt Odie R. Davidson, Jr.

55 SRW, Offutt Crew E-106: IP Capt James R. Laine, CP Capt Charles P. Mortensen, N Capt Steven J. Fred, BO TSgt Ernest S. Scott

44 SMW, Ellsworth Crew E-040: MCCC Capt Michael K. Fair, DMCCC 1Lt Craig H. Houpt

90 SMW, F. E. Warren Crew S-238: MCCC Capt Joseph A. Engelbrecht, Jr., DMCCC 1LT Steven L. Sacone

308 SMW, Little Rock Crew E-110: MCCC 1Lt Edward L. Whittenberg, DMCCC 2Lt Woody W. Parramore, MSAT Ssgt Donald E. Weter, MFT Sgt Richard D. Savage

321 SMW, Grand Forks Crew E-115: MCCC Capt J. David Murley, DMCCC 2Lt John D. Pontius

341 SMW, Malmstrom Crew R-175: MCCC 1Lt Larry R. Gerfen, DMCCC 2Lt Robert N. Shearer

351 SMW, Whiteman Crew E-145: MCCC Capt Richard D. Laskey, DMCCC 2Lt Lynn B. Wheeless

381 SMW, McConnell Crew S-204: MCCC Capt Michael E. Hawk, DMCCC 1Lt Bobby W. Moore, MSAT Sgt Daniel P. Tullio, MFT Sgt Albert J. Abbondanza

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2*.

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